W1	Learning Area	Science	Grade Level	8
	Quarter	Fourth	Date	4 DAYS

I. LESSON TITLE	THE DIGESTIVE SYSTEM
II. MOST ESSENTIAL LEARNING COMPETENCIES (MELCs)	1. Explain ingestion ,absorption, assimilation and excretion
III. CONTENT/CORE CONTENT	LIVING THINGS AND THEIR ENVIRONMENT

IV. LEARNING PHASES AND LEARNING ACTIVITIES

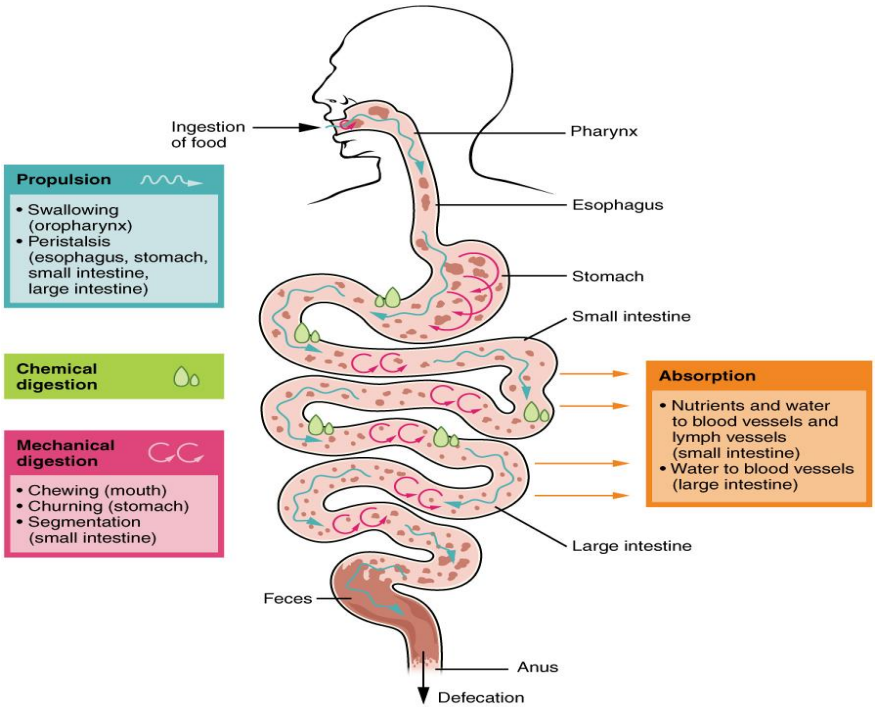
I. Introduction (Time Frame: DAY 1)

Food plays a central role in the survival of species. Food gives organisms energy that enables them to carry out the many activities they do each day; this includes predators chasing a prey or a prey escaping a predator, arboreal organisms climbing trees to gather fruits, or fish swimming in schools in search for food, to name a few. Organisms are able to obtain energy from the foods they eat through digestion.

Digestion of food is carried out by the organs and substances of the digestive system. During digestion, food is broken down to smaller parts -- a fraction of which is made up of nutrients. These nutrients are circulated to the different parts of the body through the bloodstream and assimilated by cells.

D. Development (Time Frame: DAY 1)

The processes of digestion include six activities**: ingestion, propulsion, mechanical or physical digestion, chemical digestion, absorption, and defecation.**



https://upload.wikimedia.org/wikipedia/commons/6/6d/2405_Digestive_Process.jpg

The first of these processes, **ingestion**, refers to the entry of food into the alimentary canal through the mouth. There, the food is chewed and mixed with saliva, which contains enzymes that begin breaking down the carbohydrates in the food plus some lipid digestion via lingual lipase. Chewing increases the surface area of the food and allows an appropriately sized bolus to be produced.

Food leaves the mouth when the tongue and pharyngeal muscles propel it into the esophagus. This act of swallowing, the last voluntary act until defecation, is an example of **propulsion**, which refers to the movement of food through the digestive tract. It includes both the voluntary process of swallowing and the involuntary process of peristalsis. **Peristalsis** consists of sequential, alternating waves of contraction and relaxation of alimentary wall smooth muscles, which act to propel food along. These waves also play a role in mixing food with digestive juices. Peristalsis is so powerful that foods and liquids you swallow enter your stomach even if you are standing on your head.

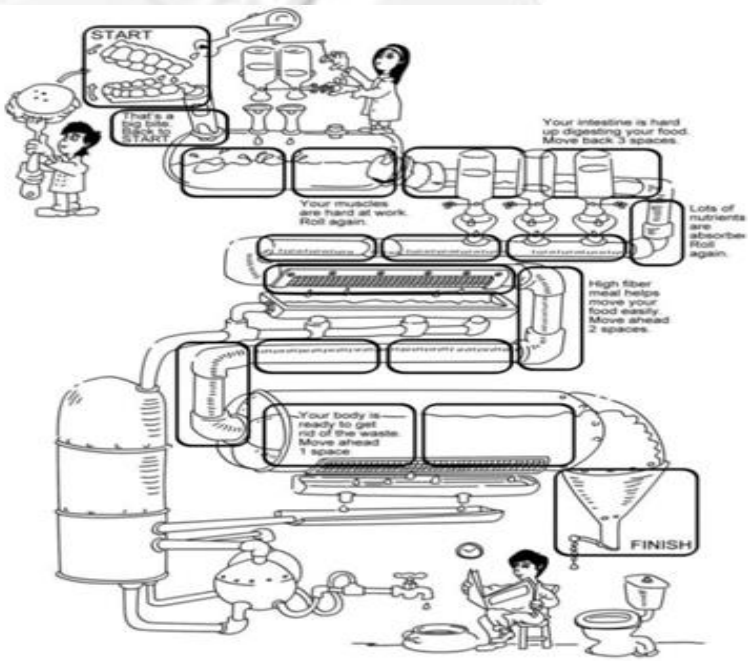
Digestion includes both mechanical and chemical processes. **Mechanical digestion** is a purely physical process that does not change the chemical nature of the food. Instead, it makes the food smaller to increase both surface area and mobility. It includes **mastication**, or chewing, as well as tongue movements that help break food into smaller bits and mix food with saliva. Although there may be a tendency to think that mechanical digestion is limited to the first steps of the digestive process, it occurs after the food leaves the mouth, as well. The mechanical churning of food in the stomach serves to further break it apart and expose more of its surface area to digestive juices, creating an acidic "soup" called **chyme**. **Segmentation**, which occurs mainly in the small intestine, consists of localized contractions of circular muscle of the muscularis layer of the alimentary canal. These contractions isolate small sections of the intestine, moving their contents back and forth while continuously subdividing, breaking up, and mixing the contents. By moving food back and forth in the intestinal lumen, segmentation mixes food with digestive juices and facilitates absorption.

In **chemical digestion**, starting in the mouth, digestive secretions break down complex food molecules into their chemical building blocks (for example, proteins into separate amino acids). These secretions vary in composition, but typically contain water, various enzymes, acids, and salts. The process is completed in the small intestine.

Food that has been broken down is of no value to the body unless it enters the bloodstream and its nutrients are put to work. This occurs through the process of **absorption**, which takes place primarily within the small intestine. There, most nutrients are absorbed from the lumen of the alimentary canal into the bloodstream through the epithelial cells that make up the mucosa. Lipids are absorbed into lacteals and are transported via the lymphatic vessels to the bloodstream (the subclavian veins near the heart). In **defecation**, the final step in digestion, undigested materials are removed from the body as feces.

Learning Task 1
Part 1A. A Gutsy game

Procedure:
1. Find a classmate with whom you can play the board game.
2. Choose a token for you and your classmate; place the tokens on the board's starting line.
3. Take turns rolling the die.
4. The number on the die determines how many spaces you will move your token.
5. Follow the directions -- if there is any -- on the space you land your token.
6. The player who first makes it all the way through the digestive system and down to the finish line wins the game.


START
That's a big bite. Back to START
Your intestine is hard up digesting your food. Move back 3 spaces.
Your muscles are hard at work. Roll again.
Lots of nutrients are absorbed. Roll again.
High fiber meal helps move your food easily. Move ahead 2 spaces.
Your body is ready to get rid of the waste. Move ahead 1 space.
FINISH

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IV. LEARNING PHASES AND LEARNING ACTIVITIES

Questions:
1. The game you are about to play is an analogy of the digestive system. What do the tokens represent?
2. What do the spaces on the board game represent?
3. What do the directions on some of the spaces tell you about the digestive system?

E. Engagement (Time Frame: DAY 2)

Learning Task 2
A Sweet Break!

Procedure:
1. Fill the two beakers with warm water. Make sure that the amount of water placed in each glass is about the same. Label the glasses A and B.
2. Prepare two pieces of candies. Wrap a piece of candy in a paper towel and crush it using a mortar and pestle or any hard object like a piece of wood.
3. Place one piece of candy into the glass of warm water labeled A and place the crushed pieces of candy in the remaining glass of warm water labeled B.
4. Observe how long it takes for the whole candy in Glass A and the crushed pieces of candy in Glass B to dissolve.
5. Record your observation.

Questions:
1. How does crushing the candy to smaller pieces affect its dissolution?
2. What does crushing the candy represent in the process of digestion?

Learning Task 3
How do enzymes affect digestion?

Procedure:
1. Number and label the test tubes (1-water, 2-fresh pineapple juice, and 3-bromeliad leaf juice).
2. Prepare a bar or one tablespoonful of granulated gelatin in the measuring cup using 100 mL of boiling water.
3. Stir well with a spoon until the gelatin is dissolved.
4. Place 3 mL of water into test tube 1, 3 mL of fresh pineapple juice into test tube 2,and 3 mL of Bromeliad leaf juice into test tube 3.
5. Add 10 mL of gelatin mixture to each test tube. Shake well to mix thoroughly.
6. Refrigerate the samples overnight.
7. On Day 2, check the contents of each test tube for solidification of the contents.
Record your observations.

Food undergoes physical and chemical change as it moves from one part of the gastrointestinal tract to the other. Digestion makes the nutrients found in food available to the different parts of the body for the organism's nourishment and overall wellness. In Learning Task 2, an enzyme called bromelain which is present in fresh pineapple juice and in bromeliad plants is used to demonstrate digestion of proteins.

Questions:
1. How did bromelain affect the protein in gelatin?
2. Which of your observations show this effect?
3. There are other kinds of enzymes in your digestive system. How do these enzymes affect digestion?

A. Assimilation (Time Frame: DAY 3)

Learning Task 4
How does food move through your digestive system?

IV. LEARNING PHASES AND LEARNING ACTIVITIES

V. ASSESSMENT (Time Frame: DAY 4)

(Learning Activity Sheets for Enrichment, Remediation, or Assessment to be given on Weeks 3 and 6)

Learning Task 5
A journey into the digestive system
The Human Digestive System

Use the words to fill in the blanks

stomach	chewed	food	energy	rectum	liver	mouth
small intestine	waste	saliva	large intestine	digestion	system	swallow
tongue	pharynx	acid	absorbed	liquids	esophagus	

All animals need to eat _____to get _____to live. But in order to use this food, they have to break it down in a process called _____. And so, all animals have a group of connected organs called the digestive_____. In humans the process of digestion begins in the _____ where food is _____into small pieces by the teeth. The_____ helps by moving these pieces around. These pieces are covered by _____ or spit. The saliva makes the food slippery so that it is easier to _____. It also helps to break down the food. Once the food is swallowed, it passes through the_____, which is like a gate that sends food into the_____ and air into the lungs. The food travels down the esophagus and into the _____. Once the food is mixed with _____and crushed some more. After spending some time in the stomach, the food is sent into the _____where nutrients are _____. The _____helps by producing some digestive juices called bile. Next, the remaining food goes into the _____where the _____are absorbed. The remaining food is called_____ and it is pushed into the _____where it wait's before leaving the body.

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VI. REFLECTION (Time Frame: _____)

- Communicate your personal assessment as indicated in the Learner's Assessment Card.

Personal Assessment on Learner's Level of Performance

Using the symbols below, choose one which best describes your experience in working on each given task. Draw it in the column for Level of Performance (LP). Be guided by the descriptions below:

☆ - I was able to do/perform the task without any difficulty. The task helped me in understanding the target content/ lesson.
✓ - I was able to do/perform the task. It was quite challenging, but it still helped me in understanding the target content/lesson.
ʔ – I was not able to do/perform the task. It was extremely difficult. I need additional enrichment activities to be able to do/perform this task.

Learning Task	LP	Learning Task	LP	Learning Task	LP	Learning Task	LP
Number 1		Number 3		Number 5		Number 7	
Number 2		Number 4		Number 6		Number 8	

VII. REFERENCES

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